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OFFICIAL PROCEEDINGS
Meeting of September, 1923

VOL. XXII.
NO. 6.

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INCORPORATED
OCTOBER
1913

Canadian Railway Club

MONTREAL

PARVA SUB INGENTI

CONTENTS:

Report of September Meeting
and
Paper and Discussion
on
"What is Your Material Handling Problem"
also
Index of Papers presented before All Railway Clubs during Season 1922-1923 and their Authors.

AUG 1 ? '13

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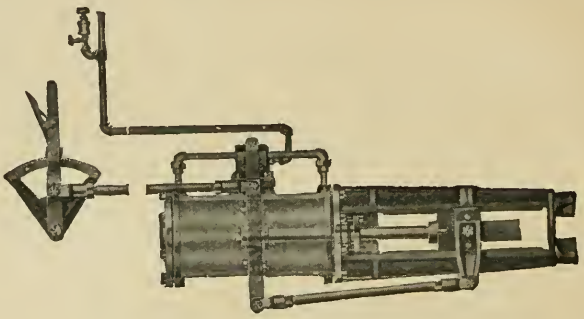

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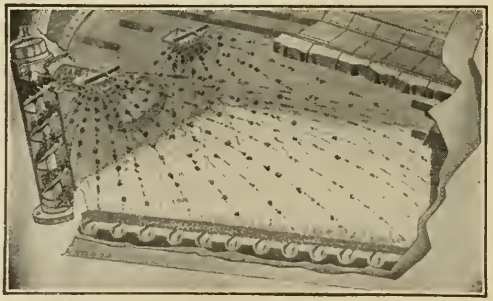

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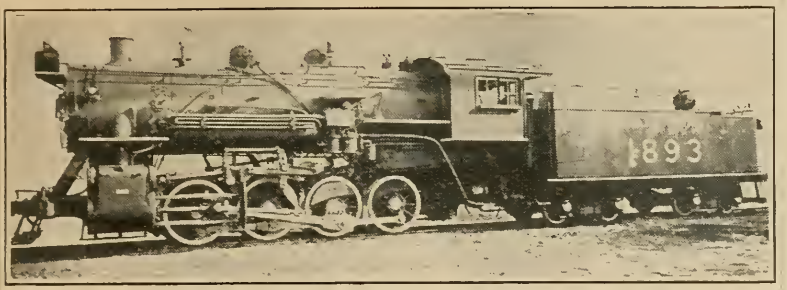

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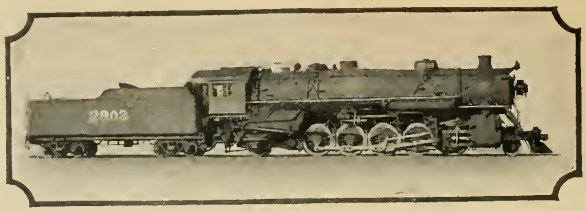

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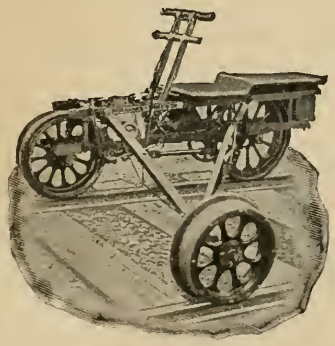

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1922-23

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W. A. BOOTH, Secretary, 53 Rushbrooke Street, Montreal.

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PROCEEDINGS OF THE CANADIAN RAILWAY CLUB

Windsor Hotel, Montreal,

September 11th, 1923.

Chairman: (Mr. H. R. Naylor.)

Will the meeting please come to order. I would be glad if the members will fill in the attendance cards and pass them along to the centre aisle.

It is customary to read the minutes of the previous meeting, but as they have already been printed and mailed to the members, we can dispense with the reading of them.

In view of this being the first of our meetings for this season, I think it will be in order to make a few brief remarks. Last year, gentlemen, was one of the most successful years this club has had, the meetings being well attended and I am certain we all profited by them. Furthermore, I have every confidence in this year being equally successful, at the preliminary meetings of the Executive, the syllabus has been prepared in which we have been fortunate in persuading very capable gentlemen to read papers for us, and I feel sure the subjects will be of general interest to our large membership.

There is just one more remark that I wish to make, and that is in regard to the opening of the meetings. As you know, it is customary to commence at 8.30 p.m., let us make a special effort to do so; it will then give us ample time for discussion and enable us to get home at a reasonable hour. I will now ask the Secretary to announce the list of new members.

NEW MEMBERS

F. W. Bidgood, Shop Draughtsman, Cabinet Dept., Can. Car & Foundry Co., Turcot.

E. Gougeon, Asst. Foreman, Steel Shop, Canadian Pacific Rly., Angus Shops, Montreal.

Col. O. Lobley, Gen. Mgr., The Holland Varnish Co., Montreal.

J. Montdeuil, Car Foreman Can. National Rly., Montreal.

H. Pickup, Slerk Storeman, Can. National Rly., Coteau Jct., Q.

N. Racicot, Asst. Foreman, Steel Shop, Can. Pacific Rly., Angus Shops, Montreal.

J. Scurti, Steel Carman, Steel Shop, Can. Pacific Rly., Angus Shops, Montreal.

W. N. Watson, Master Mechanic, Can. Steel Foundries, Ltd., Montreal.

Chairman:

Will somebody make a motion to that effect.

Mr. W. A. Booth:

I move they be accepted as members.

Mr. A. McDonald:

I second that motion. (Carried.)

MEMBERS PRESENT

Naylor, H. R.
Bailey, E.
Beck, W.
Biggs, J.
Bourgouin, J.
Bowers, C.
Brousseau, S. R.
Buckland, A. W.
Buckland, J. W.
Buckle, W. E.
Burns, J.
Campbell, M. M.
Clark, W.
Cooper, A.
Cole, E.
Coleman, J. W.
Coleman, M. T.
Crawford, R.
Crockett, W. B.
Dow, A. W.
Duprais, A. E.
Ferguson, B. H.
Ferguson, T.
Ferguson, T. W.
Fletcher, J.
Fielding, W. G.
Gardner, K. V.
Gilson, F. W.
Guest, A.
Hanson, L. J.
Harbec, A.
Harrigan, H. C.
Hart, A. E.
Hearn, J. H.
Holland, N.
Hopperton, L.
Mackie, R. L. D.
Horn, B. T.
Horwood, H. E.
Inns, G. A.
Jefferies, G.
Jenner, W.
Kennedy, J. W.
Lachapelle, D.
Maguire, J. D.
Manson, L. W.
Manthorp, E.
Masse, O.
Melanson, A. C.
Miles, A.
Monks, F. H.
Moore, A. C.
Moseley, F. A.
Mullaly, M. J.
McDonald, A.
McWilliams, J.
McVicar, R.
Ogden, J.
Palmer, W.
Parsons, H. J.
Patterson, W. R.
Payette, H. M.
Payne, H.
Pearce, H.
Pearson, E. W.
Peverley, R. D.
Pierpont, T. H.
Prouse, W.
Robb, G. W.
Robertson, A. S.
Rehfuis, Jr., O. C.
Richardson, S.
Rogers, W. B.
Saddler, E.
Seccombe, A. G.
Sheridan, W. P.
Sleigh, T.
Spidy, E. T.
Starkey, J. B.
Taylor, S. G.
Thorp, H. W.
Tinkler, J. E.
Tirbutt, A. M.
Viberg, E. R.
Vincent, G.
Webb, W. C. H.
Wilson, E. W.
Wilson, G.
Wilson, G. M.
Wilson, G. W.
Winship, S. B.
Yost, W. H.
Booth, W. A.
and others.

Chairman:

We are to have a paper this evening by Mr. E. T. Spidy, Asst. Supt., of the Dominion Engineering Works, the subject being, "What is your Material Handling Problem?" To most of us, no matter what line of business we may be in, handling of material presents many problems. Mr. Spidy, with whom I and others here have been previously associated, can speak with authority on this matter, and in glancing over his paper, it is evident that he has gone into the subject most thoroughly. In conjunction, we are also to have some motion pictures on the handling of material, which I am sure will also be very interesting. I will now call upon Mr. Spidy to read his paper.

WHAT IS YOUR MATERIAL HANDLING PROBLEM?

By

E. T. Spidy, Assoc. Member A.S.M.E., A.M.I.E.C.
Asst. Superintendent, Dominion Engineering Works, Ltd.

When we speak of material handling, we speak of a universal problem that every shop, storehouse or business house in the country has to deal with. To some people, material handling may be just pushing a truck, driving a horse, or running a motor truck, but to the man who is alive to running his department or business economically, it is money. Material handling represents money spent on that material that does not add to the intrinsic value of that material. In a broad sense, it is money spent for nothing. I do not, of course, mean that the transportation of finished material to its market is spending money for nothing, but I do mean that if you spend ten dollars moving certain material in your shop when, with more modern methods and equipment, your cost would be five dollars, then the five dollars you have lost is just as good as money lost as any you have made from the installation of modern machinery for productive operations. In other words, money saved by moving material economically is profit, and investment in men and machinery for material moving, for profit, is just good business horse sense.

Pointer No. 1, therefore, to bear in mind is that "Moving Material Costs Money" and Pointer No. 2 is "Moving Material Adds Nothing To Its Value."

This may look like a "Simple" statement, but it isn't as simple as it looks. Everybody may know that moving material costs money, but does everybody act and think as though

they know it? If you knew how many times your men or helpers go to the stores for material only to find that it isn't there—out of stock—not over yet, if you knew how many calls your five-ton truck makes to various points in town, at supply houses, customs brokers, express warehouses, to get material—not in yet, some papers not in order, can't find it—for nothing, in other words. Again, if you knew the number of interdepartmental trips made with a two thousand dollar electric truck and two men to gather up a hundred pounds of material, maybe only to get a ten pound load, you would realize that the remark "Moving Material Costs Money" is no simple one.

Now, the foregoing is absolutely true, more true than we dare admit in cases, and I mention these only to draw your attention to the problem behind it all. It is all very well to realize that it costs money, and that it adds no value to the material to move it about, but, "We have *got* to move it" and that's all there is to that, so let us consider the problem as we have it.

Into the movement of any material the following factors enter:—

1. The Man.
2. The Trucking System.
3. The Material to be moved.
4. The Conveyance.
5. The Distance the Material has to be moved.
6. The Roadbed on which the movement is made.

The best solution of a problem of this nature is found by separating the "known" factors and the "unknown" factors, just like a problem in mathematics. The more "knowns" we can get into this problem, the more certain we are of the result we will get. Likewise, the more unknown factors or unstandardized factors that we have to deal with, so will the results be more unknown.

THE MAN

To my mind the man, or men, operating and directing the movement of material is the most important factor. He is an "unknown." Starting at the bottom, the men employed on the floor to move material, either by push truck, motor truck, crane or other means, are a grade of labor that come from the unskilled class. We pay them by the hour and their responsibility is usually to a gang leader or foreman. His main fear is that he will lose his job, and his chief concern is to put in

his time. He is not worried after he has gone a mile only to find the material not there, that's somebody else's worry. I speak of the class of help generally—because there are always exceptions that make a bright spot for us here and there.

The problem with regard to the man lies with the management. In order to get the economic result that is obtainable with very expensive electric trucks, motor trucks or other material handling apparatus, the management must spend much thought and study on the operator. The management must find the man who thinks the job is a "good" job, and then it must spend some time training him to think about his work, and getting ahead of it, until each man does take some interest in its accomplishment.

Lots more could be said about the "Man" side of material handling. One man operates a twenty thousand dollar overhead travelling Crane inside a shop. He can, by poor management, cost us hundreds of man-hours a week in idle time on the floor. Another man operates a travelling hoist crane in the yard with two or three assistants. Unless his work is planned ahead of him carefully, he will be idle, perhaps a third of his time, and nobody know it. That is why I say, this is a management problem.

Now, many supervisors have gotten so pessimistic about how much work a man will do that they have ceased to believe that anything can be done at all. For myself, rather is it, that the supervisors have ceased to be supervisors than that the man cannot be trained to produce. More than half the problem is in proper direction: If a foreman sends a truck driver to get some material when he doesn't know himself whether it is there or not, how long do you think it will be before the driver gets wise? He will soon be so wise that he will think ahead of the foreman and, in a short time the foreman will not be able to tell when he is loafing or working.

What I will call Pointer No. 3 is that "It is a management problem to get and train the right men."

Pointer No. 4 is that "The Management must have an accurate knowledge of the 'When to move material,' and give its instructions in some clear form to the men who are to move it.

This leads us naturally to the question of systems in connection with moving material.

SYSTEMS.

What is your system of handling your material problem? Have you a system, or have you simply got some men and some trucks, and they do what everybody tells them?

These questions depend for their answers on the type of shop being referred to, the number of men in the plant, and the material itself. Dealing with the internal interdepartmental movement of material, there are three distinct systems that may be mentioned:—

1. Every shop department does its own trucking.
2. General trucking boss in charge of all trucking.
3. All trucking controlled by a production department.

The first is the oldest method and still considered the best by foremen who have no conception of what trucking service costs. Mr. Oldtimer, as I might call him, could get rid of all his troubles if you gave him an electric truck for himself, so that whenever he wanted anything he could send for it. No, sir, he is not dead yet by a long way. Aside from this, it is a question whether in some cases, even where regular power truck service is in operation, it is or not the best plan for the foreman to direct and control all movements of material within his shop limits by hand truckers. Where an overhead travelling crane is operating exclusively in a department this is undoubtedly the right method, but, if the same crane serves several foremen, unless the control is out of the hands of them all there will always be trouble.

The second method of having a general trucking boss is a good one, especially for large shops. In this case foremen place their orders for material to be moved in convenient boxes, where the trucking boss can get them. According to the equipment he has, the trucking boss will hand these orders to the various truckers to attend to. A trucking boss serving, say, twenty departments, would assign certain regular routes for the trucks to travel over regularly. These routes would be arranged in conjunction with the departmental foremen who would have regular allocated bases where they would place material accessible to the truckers. This results in "keeping the trucks moving" a maximum part of the time with as little time lost loading and unloading as the facilities at each base permits. A "live" boss is an essential to the success of this system, because he has considerable ground to cover, and if he lags the whole gang will lag.

The third method is more used by manufacturers than railroads because it often meets their requirements better. Where a central control system directs all productive operations, it is a simple matter to issue a "Move Order" to the trucking boss under the direct control of the production department, to move material from one operation or place to the next, and then to return the order as done. This gives exact knowledge as to location and condition of all parts of an order which, for some plants, is essential.

It is obvious that no one can recommend one system or another without studying all the actual conditions at a plant, because the buildings, floors, layout of machines, space between machines, storage space, power and many other details have to be considered all with a view to getting more service for less cost, or at least equal cost. One thing is certain, however, there should be a definite system; there should be a "Master of Ceremonies" somewhere in the organization whose duty is to keep track of material wanted, ordered, expected in, where it is to go, and when it is to go, and to keep foremen posted and to see that it goes.

You see that what I am trying to drive home is, that it is not men, or power trucks, or cranes alone, that make economical material handling. You probably know shops where foremen, general foremen, not to mention any other, do little else except find out what material is short in this department and that, and spend the best part of their day walking miles between stores, departments and shops, and kid themselves they are hustling the work along, when, in reality, they only accomplish what a material chaser does, and far more efficiently, too.

Pointer No. 5 I would enter as "Have a definite routing and trucking system."

Pointer No. 6, "Have a clear-cut material tracing organization."

THE MATERIAL

The next factor for consideration is the "Material to be moved." If we are a specialty plant, making just one thing, the problem from this angle would be simplified considerably, but nevertheless we all have departments where the material bears a similarity, where special moving appliances may be warranted rather than general purpose appliances.

Special trucks are in general use for handling axles, wheels, steel plate, etc., special conveyances for coal and ashes and similar material, and so on. This does not, however, in our shops to-day, cause us the concern that the large bulk of material to be moved does. We have to consider size and weight principally. In machine shops it is weight, parts above a certain weight have to be assigned to travelling cranes and cars. Smaller parts up to certain weights can be handled on portable trucks if we provide facilities to load and unload them. Then we have smaller parts that can be loaded and unloaded by hand. In metal working departments, we prefer trucks that are low to the ground, whereas for lighter materials a high truck is better, since it does not require men to bend down so much. In wood working departments, size of material demands an open construction of truck, so that a large quantity can be loaded. In consideration of these items, none must be lost sight of, because the more time, after your equipment is decided on, your truck operators can say "if" we would only get that on, or this on, so much more of an "unknown" does this factor of your service become.

Po'nter No. 7, "Definitely decide what material you have to move before you purchase any equipment.

THE CONVEYANCE.

Having considered the human side of the question of handling material, we next turn to the conveying vehicle, which term probably includes all the kinds there are. The day is gone that mechanics will lift a heavy job even to the bench by hand. Whether this is due to the advance in the labor union science, the strong backs of our fathers, I don't dare say forefathers, or the advance in designs of labor-saving devices for material handling, is somewhat of a question. We do know, however, that the combined result plus the output requirements of the present day, makes it necessary for us to install the best adapted mechanical apparatus available, in order to arrive at a low cost per unit of material handled. Experience to-day in this line, teaches that machinery is more dependable than men. Therefore, the slogan must be that the fewer men and the more machines the better will be the service.

It is not my intention to more than mention briefly the classifications and service of the various types of equipment

that are offered to-day. Each plant or service condition is dependent on so many local conditions that any recommendation would be futile. As in the purchase of any machinery, one usuelly gets just what one pays for—no more—no less. If you pay a Ford price and expect a Packard service, you are off the track, that's all. It may truly be said with regard to moving materials that "We are paying for the finest equipment obtainable, whether we have it or not." If you buy cheap power trucks, cheap cranes or hoists you pay the rest in man-hours either keeping the same in service or in manpower, doing the service the equipment will not.

The market offers us to-day power trucks of all descriptions. These are electric, gas or steam driven. We can operate single unit power trucks or we can have a locomotive and trailers, and we still have horses. In this country, with our snow winter conditions, the horse is a factor in no ways to be forgotten. We have to consider carefully if our handling consists of outside work, whether we want to operate on tracks or on the level ground. The merits of gasoline and electric trucks are debatable points that have relation to weight of loads any grades, and duration of continuous service. It must be remembered that electric trucks require a charging station, and for large plants, several charging stations if it is desired to get trucks on the job quickly after the whistle blows.

Now we can get trucks with their own hoisting, loading or dumping devices, or we may think it advisable to place stationary jib cranes or other means at loading points where no other service is available. We have got to look at the speed at which these hoisting devices work, because if you do provide power hoisting service, you must remember that it is human nature and men will wait for a crane fifteen minutes rather than lift a twenty-five pound load, unless someone sees them.

Trailers that are left to be loaded and unloaded in predetermined places in each department offer a very economical service where they can be adopted, because they reduce the initial investment for power-driven cars or locomotives. Running a trailer service after the manner of train schedules, tones up the system and gets material moving on time.

For storing service, there are several types of cars that save labor tremendously. Special tiering devices, special elevators, slides, spirals, gravity runways of all descriptions are available, that it pays to study the conditions thoroughly and over a period before deciding what you require.

For overhead service, we have travellers and monorail systems. Variations of design in overhead travellers can be had to meet almost every conceivable service condition inside or outside of our plants. Initial cost is always the main factor in considering this type of installation, and it is therefore doubly necessary to study the economics or savings in this connection, for it must be remembered that such service is limited. Usually this class of service is necessitated by the weight of the material to be handled. In some places there is no choice at all, but in others, such as founderies, where material and equipment to be handled is both heavy and bulky, and necessitates outside as well as inside service, it is a question for study as to whether the outside service would not be better handled and give greater storage capacity by the use of a locomotive travelling crane.

The machinery we use, whatever type it may be, is one of the "known" factors of our problem, once we have made our decision, therefore, Pointer No. 8 may be entered on our list as "Make an extensive study of each type of equipment that will handle the material right." Pointer No. 9 "Tabulate Number of Men Employed, Wages per Day, Service Cost per Day, and Weight Handled per Day against existing service and each prospective service," so that you really know what you are talking about, and are prepared to stand by your statements.

THE DISTANCE MATERIAL HAS TO BE MOVED

The distance material has to be moved is a question that involves the layout of the plant. Many Industrial Engineers make this their primary study when they analyze a plant because their experience has taught them that very often more money may be saved by rearranging the manufacturing machinery than by trying to design a material handling system to handle it from operation to operation, forward and backwards, doubling over its own tracks and every other way, as is often the case. I would seriously recommend any supervisor, looking to save money in his department, to take a plan view of his department and draw on it lines indicating the course material has to travel, from the point where it enters right on until it leaves. It will provide food for real thought and plenty of chance for initiative.

It is my belief that the material handling problem from this viewpoint is the least known and considered by managements to-day. Yet it is probably the most lucrative source of

money saving in our plants, especially the older plants, because from time to time new machinery has been installed, each time with a view to getting its output, that the course of time has complicated the path of the material, until our chart of its course looks more like a Chinese puzzle than the sane, straightforward plan of a businesslike engineering plant.

Coupled with the question of distance material has to be moved is quantity, in the consideration of equipment. For short distances, light loads, travelling at greater speeds are usually preferable to heavy loads at longer intervals. The lighter the load one can decide on as the requirement, the less money has to be invested in equipment. I would point out that the investment rather than actual outlay should be the factor in considering material handling expense.

Pointer No. 10, "Study material routing and change the layout rather than install a poor system."

THE ROADBED.

The roadbed is literally, as well as actually, the foundation of the material handling system, no matter what kind of a system it is. We all have them, and hate to spend money maintaining them, somehow or other. Where we have push trucks on industrial tracks we would find turntables that turned only sometimes, then we threw out the turntables because they were so much expense to maintain and put a smooth plate in its place, oiled it and slid our truck around. It took extra men, sometimes, but now the tendency is to throw out the tracks, too, and use power trucks that require a smooth roadbed.

We first tried to do without the special roadbed outside and between shops, but the great teacher, experience, soon taught us that to travel over rail tracks and on dirt road was poor business, that we lost speed, that maintenance cost was higher, that it was harder on the men, that we now realize that part of the initial expense should be a sound and solid runway. Where winter snow conditions are to be met without proper roadways, I would say that money was being thrown away. Incidentally, a good road is easily kept clear and definitely locates routes and limits properly the operation of the system.

With regards to the maintenance of overhead traveller tracks, monorail tracks, yard tracks, it is unnecessary to add, that what you save this year by not doing, you probably spend

next year or sooner in "cars off the track," accidents, or other causes. Maintenance work, to be carried out for the lowest cost, requires first of all an intelligent "got the job at heart" boss. Without such your job is never liable to be done.

Pointer No. 11, "Consider the roadbed just as much as you do the equipment that has to travel on it."

SUMMARY

Speaking before this Railway Club one cannot help thinking that railway men ought to be the most efficient material movers in the world, since the whole existence of railways depends on the movement of material. How much thought is given, and how much depends on "the man" and men that make up railroads? We know that railroads are known to the world by the names of the men who run them. Their standing, in points of ability at their respective jobs, and the service they make possible, and give, is the measure of business they obtain, and that, in turn, is the measure of the success of the company.

How much thought do railways give to the "Material to be moved" whether it is human or freight. We know that if a competitive railway gives more thought to this question than another that it takes the business.

Also with regard to the "Conveyance," "Distances to Move," and "The Roadbed," Railroads give these questions the greatest attention because they have to if they would make money for their company, which is the only ultimate object and purpose of their existence as with any business.

We are quite justified in taking our plant material handling problem every bit as serious as the large transportation companies do their major business problem. The high aims of railroads result in two things, namely, "low cost per unit" handled to themselves, and "service" to the customer. Just because you happen to be the customer as well as the operator, in plant material handling service is no reason why you can afford a poor service or an expensive service.

I have endeavored in making this talk on the material handling problem to line up a number of pointers which, if studied and acted on, will tend to make each of the factors entering into the problem more of a "known" factor than an "unknown." Just so long as we have "unknowns" so long

will it be a problem. Likewise, the more we study these factors and are able to standardize them, so much closer does our problem narrow down to a place where we know what results we are getting for our expenditure.

At this juncture some moving pictures were screened showing various methods of handling material, which was very interesting.

Chairman:

The pictures we have just seen, gentlemen, show the possibility of the tractor to hauling material. In many respects, the modern ways of material handling can be likened to a new science, it has developed rapidly in recent years, as an example, one can only compare the tractor service in modern plants with the limitation and expense of the old style push-lorry system. In many shops the transportation of large quantities of heavy material is no doubt an expensive operation, owing to proper facilities being overlooked at the time of construction of the shops. There is no question that this matter is better appreciated to-day and more provision is made for economical handling. The paper is now open for discussion, and we have with us many gentlemen familiar with the subject, and I am sure Mr. Spidy will be glad to answer any questions which no doubt you may wish to put to him.

Mr. T. M. Hyman:

Mr. Chairman, the problem of handling material, whether for fabricating or removing old material, especially in our Railroad shops, is a difficult one to solve; more so in the older type shop than those equipped with modern facilities. For instance, our Canadian National, Point St. Charles, Shops were built a number of years ago and were not laid out to efficiently handle the amount of material which we have constantly moving in and out of our shops to-day. Our method for handling the material is the old Push Lorry one, running on rails, with turntables at various points, and it can easily be understood that valuable time is often lost through congestion at these points. Again, it seems that where we have no trolley track, all material must be carried by hand, which involves the wasting of valuable time that could be used to advantage elsewhere.

There is also the problem of keeping your repair shop clear of old material which is being stripped from the various classes of equipment under repair. This, if not properly

handled,becomes anything but a Safety factor in your shop, also, it retards the workmen to no little extent. Therefore, such old material has to be moved at any cost and, in my opinion, the Motor Lorry—as portrayed in our Motion Pictures here to-night, and which one sees in the plant of the Canadian Car & Foundry Company at Turcot—is able to move around and assist in clearing this more expeditiously than any method I know of.

The latter method—the use of tractors, which can be run to any corner of the shops—is the only system by which you can overcome, to any great extent at least, the material problem.

Chairman:

Perhaps Mr. Buckland would like to say a few remarks in regard to the subject of the paper.

Mr. J. Buckland:

I did not come here to make any remarks, but first of all I wish to apologize for the mishap we had tonight with the pictures. I regret we did not show pictures of material handling in locomotive and car shops by trackless train method. The material handling problem is one that I think everyone should make a study of, and it can be regulated to suit the conditions of work in both old and new shops, if in the remodelling or rebuilding old shops and designing new ones, sufficient attention is given to routing and good flooring. I am sure a great amount of money will be saved in this respect.

You might have noticed that long train when it came through on the pictures. I heard a titter of laughter then and I guess some of you gentlemen thought it was doubling, but it was actually as shown. It is remarkable the manner in which these trains of trailers can be handled; for instance, you can practically describe the letter "S" with this train and your trailing truck—if properly designed, will follow in the same path as the tractor.

I have nothing further, I believe, to say. I thank you.

Mr. J. W. Kennedy:

Mr. Chairman, I have listened with a great deal of interest to Mr. Spidy's paper which covers a subject in which I am particularly interested at the present time. He has brought out a number of problems which it will take too much time to discuss individually, but there are one or two which possibly are of the greatest importance. The problem of "The

Man," to my mind is one of the most important in the question of handling of material. Recently, I had occasion to make some tests in connection with the handling of material and was struck very forcibly with the importance of this problem. In checking up the quantity of material transported by the individual tractors it was found that a great deal depended upon the efficiency of the man and the interest taken by him in the handling of his machine. It became known that a check was being made of the number of loads hauled by each tractor, and very soon the drivers were competing against each other to make a good showing. This spirit of competition is a very good thing to obtain when handling "The Man" problem.

It would probably be very interesting to the gentlemen present to know the results of one of these tests as to the quantity of material hauled by one tractor. One of the tractors in use at our shops on actual test showed that it had covered a distance of 24 miles in one day, and hauled a total of 210 tons. The quantity moved is so great that it can readily be appreciated how important it is that any waste time be eliminated.

Another of the problems that Mr. Spidy has mentioned is responsible for a great deal of this waste time. I am referring to the question of distance material has to be moved. Everyone appears to be in agreement that the question of handling of material is a very important consideration in the laying out of new shops, and when this question is being considered, the distance which the material has to be moved is one of the most important matters that should be taken into account.

In this connection there is another important question which should be considered and that is, the location of the "Home" of the tractors or trucks. The closer the charging station is to the part of the plant at which the truck is working, the less waste of time will there be in the movement of the truck or tractor to and from its work. These machines start out at eight o'clock in the morning, return again at noon and repeat the same performance in the afternoon. It is remarkable the amount of time that is lost in this way. We have seen to-night some motion pictures of tractors commencing work apparently when the whistle blows. This is the ideal we are striving for, but we must acknowledge that it is not the practice. A great deal of time is lost just after the whistle blows to commence work and just before the whistle blows to quit work by the machines travelling to and from their respective shops where they are working. This waste of time occurs at four periods of the day, and it is surprising what

it amounts to in the total quantity of material moved. To my mind this is also an important factor to be considered in the handling of material and when laying out new shops.

Chairman:

I understand there is a difference of opinion as to the relative merits of the gasoline and electric tractors; the question of serviceable and economical roadbed and tractor service is also worthy of consideration. Mr. Spidy, I notice, in his paper, mentions that the better system of controlling the tractor and trucking system is to control it through the production department. Will he kindly explain just what that involves.

Mr. E. T. Spidy:

To describe that system in more detail I would explain that in shops controlled by a production department, orders are issued to foremen of the respective departments, covering the next job for each machine. These orders are not issued to the foremen until the material is actually ready for the operation referred to, or until notice is in the production department that the previous operation is finished. It is thus seen that between these orders a move order to a "Boss Mover" can be issued, who will place material where it is required.

I would like to add a word of thanks to Mr. Buckland for his efforts in rushing the films from Chicago as he did, and which have demonstrated the utility of power driven in dustrial trucks so forcibly. It is possible to convey by means of pictures very quickly the capacity of such services, and I am sure we here to-night have a better idea of same from having seen the pictures than we have ever had previously.

Mr. J. Burns:

Mr. Chairman, I have listened with a great deal of interest to Mr. Spidy's paper, and I am quite conversant with the different problems he has outlined as Mr. Spidy was located at Angus Shops and made the arrangements now existing in connection with the different departments, and I am sure the foundation he has laid there has been of great benefit. In listening to Mr. Hyman's remarks in respect to the comparison between old and new shops, even in the modern shop the tractor system is practically new and you have practically to make your own arrangements for same. It is a floor proposition and requires a little space, but in fact not any more than the push lorry does.

It affords me great pleasure in moving a vote of thanks to Mr. Spidy for his very fine paper, and I am sure we will all learn a little if we will study the facts brought out.

Mr. A. M. Tirbutt:

I will second Mr. Burns' motion.

Chairman:

I am sure that we have enjoyed the paper this evening and I would like to thank Mr. Spidy for the time he has devoted to the production of his paper, which has been instructive in many ways. Next meeting we are to have a paper prepared by Mr. G. A. Kell, Safety Engineer of the Canadian National Railways, on "Accidents, their cause and prevention," and I trust that we will have another good attendance for that evening. As there is no more business, gentlemen, I would ask you to partake of refreshments which the Secretary has kindly arranged for.

IN MEMORIAN

T. H. MOORE
DIED
AUG. 17th. 1923.

J. A. PICARD
DIED
JULY 26th. 1923.

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COMPILED BY THE SOCIETY OF RAILWAY CLUB SECRETARIES

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Harry D. Vought, Room 314, 26 Cortlandt St., New York, N. Y. Secretary.

Sep. 16, 1922.—"The Real Functions of thee Department of Purchases and Stores." By *H. C. Pearce, Director Purchases and Stores. C. & O. R. R., Richmond, Va.*

Approval of Railway Clubs. By *W. H. Truesdale. President. D. L. & W. R. R.; E. E. Loomis, President, L. V. R. R.: Ralph Peters, President, L. I. R. R. B. D. Caldwell. President. Wells Fargo Express; Frank McManamy, Washington: Samuel Higgins, U.S. Labor Board. and others.*

Abstract of Minutes, Society of Railway Club Secretaries.

Oct. 20, 1922.—"Speeding up Operation." By *C. H. Morrison, Signal Engineer, N. Y. N. H. & H. R. R.; Henry M. Sperry, Consulting Signal Engineer, and others.*

Nov. 17, 1922.—"The Labor Problem on the Railroads." By *Charles H. Stein, G. M., C. R. R. of N. J.; E. T. Whiter, Assistant to V. P., Penn. System; Leo I. Kennedy, General Chairman, Fraternity Maintenance of Way Men, Pennsylvania System.*

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Jan. 19, 1923.—"Technical Training and Railroad Apprenticeship Systems." By *Walter B. Russell. Director, Franklin Union, Boston.*

"ARE WE DUE FOR A RADICAL CHANGE IN LOCOMOTIVE CONSTRUCTION?" By *A. F. Stuebing, Railway Age;* "Railroad Veterans' Associations." By *John Draney, Locomotive Engineer, D. L. & W. R. R.* "Possibilities of the Diesel Engine." By *Elmer A. Sperry;* "Reliability and Dependability of Steam." By *James G. Dudley.*

Feb. 17, 1923.—"Australia and its Railways." By *F. M. Whyte.*

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May 18, 1923.—"Lecture Courses for Supervisory Forces on the Pennsylvania System." By *I. U. Kershner, Service Agent, E. Region, Pennsylvania System.*

CENTRAL RAILWAY CLUB

Harry D. Vought, 26 Cortlandt St., New York, N. Y.
Secretary-Treasurer.

Sep. 1922.—"Power of the Railroad Club." By *George M. Basford,* with approval and indorsement by Presidents of a number of prominent railroads and other closely allied interests. "Fuel Economizer." Results of a series of important tests at Purdue University.

Nov. 23, 1922.—"The Training of Men to Act in Supervisory Capacities and Best Results in Handling Men." By *F. W. Brazier, Assistant to General Superintendent, Rolling Stock, N. L. C. R. R.*

Jan. 11, 1923.—"More Miles Per Car and More Tons Per Load; How the Mechanical Department Can Help the Operating Department Save Money." By *J. J. Bernet, President, N. Y. C. & St. L. Ry., and others.*

Mar. 8, 1923.—"Some Fundamentals of Train Control." By *F. L. Dodgson, Consulting Engineer, General Railway Signal Co.*

Apr. 12, 1923.—Smoker and First Interim Meeting. "Errors in Billing." By *C. L. Leonard, General Freight Agent, South Bufalo Ry.; S. C. Roth, Freight Agent, Pennsylvania System*: "Proper Inspection and Preparation of a Box Car for Grain and Flour Loading." By *W. H. Sitterly, General Car Inspector, Pennsylvania System.* "Is it preferable to provide an outside inspection pit where locomotives can be inspected and minor repairs such as tightening, etc., can be done previous to placing locomotives in engine house?" By *F. L. Huston, M.M., Pennsylvania System; C. A. Overdorff, Gen. Foreman, Pennsylvania System; J. A. Talty, Franklin Ry. Supply Co.*

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Bruce V. Crandall, 605 N. Michigan Ave., Chicago.
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Sep. 1922.—No Meeting.

Oct. 16, 1922.—"Steam Railroad Electrification." By *S. B. Cooper, Westinghouse E. & M. Co.*

Nov. 20, 1922.—"Industry and the Man." By *Samuel O. Dunn, Editor, The Railway Age.*

Dec. 18, 1922.—Address by *The Hon. Ben. W. Hooper, Chairman, United States Railway Labor Board.*

Jan. 15, 1923.—Address by *F. W. Sargent, General Solicitor, Chicago & North Western Railway.*

Feb. 19, 1923.—Address by *W. G. Lee, President, Brotherhood of hood of Railroad Trainmen.*

Mar. 19, 1923.—Address by *E. T. Whiter, Acting Vice President, Northwestern Region, Pennsylvania System.*

Apr. 16, 1923.—Address by *Hon. Sidney Anderson, Member of Congress.*

May, 1923.—Thirty-Eighth Annual Meeting and Annual Dinner. Address by *Hon. Robert G. Cousins.*

NEW ENGLAND RAILROAD CLUB

Wm. E. Cade, Jr., 683 Atlantic Avenue, Boston, Mass.
Secretary.

May 9, 1922.—"Maine the Sportsman's Paradise." By *E. S. Jones, Boston & Maine R. R.*

Oct. 19, 1922.—"Some Elements of a Freight Car Shortage." By *W. C. Kendall, Manager, Railroad Relations Section, Car Service Division, American Railway Association.*

Nov. 14, 1922.—"New England's Railroads from a Commercial Purchasing Agent's Standpoint." By *Charles F. Shirley, Purchasing Agent, Forbes Lithograph Manufacturing Co.*

Dec. 12, 1922.—"The Preservative Treatment of Cross Ties and Timber." By *F. C. Shepherd, Assistant Chief Engineer, Boston & Maine R. R.*

Jan. 9, 1923.—"Is the Steam Locomotive out of Date?" By *L. C. Coleman, Assistant General Manager, Boston & Maine R. R.*

Feb. 13, 1923.—"The Evolution of Canadian Transportation." By *J. H. Walsh, General Manager, Quebec Central R. R.*

Mar. 13, 1923.—Fortieth Annual Meeting, Election of Officers and Reports, addresses by Past Presidents of the Club, and a moving picture exhibition by *B. V. H. Johnson, Vice President of the Commonwealth Steel Company.*

Apr. 10, 1923.—Annual Entertainment.

May 8, 1923.—"Use of Compressed Air in Track Maintenance and Construction." By *W. H. Armstrong, Ingersoll-Rand Company.*

ST. LOUIS RAILWAY CLUB

B. W. Frauenthal, Drawer 24, M.P.O., St. Louis, Mo.
Secretary-Treasurer.

May 12, 1922.—"The Issue." By *James W. Byrnes, President Byrnes Belting Co., St. Louis, Mo.*

June, July and August, 1922.—Comprehensive story of "The Herrin Conspiracy," presented by investigators and eye-witnesses.

Sep. 8, 1922.—"Backhauling of Western Raw Materials to Eastern Congested Area Hampers Railroad Efficiency and Proper Industrial Development." By *R. D. Sangster, Industrial Commission, St. Louis Chamber of Commerce.*

Oct. 13, 1922.—"Legal and Economic Questions Arising Out of the Shopmen's Strike." By *Nat. S. Brown, Vice President and General Solicitor, Wabash Railway, St. Louis, Mo.* "Legislation Affecting Industry in Missouri." By *Elmer Donnell, Managing Dircetor, Associated Industries of Missouri.*

Nov. 10, 1922.—"The Organization of Industries of the United States Viewed From the Railroad Standpoint." By *Paul W. Brown, Editor and Publisher, "America at Work," St. Louis, and E. M. Johnston, District Manager, American Rolling Mill Co.*

Mar. 9, 1923.—"From Cape Town to the Congo." By *Edward C. Fisher, District Sales Manager, American Locomotive Co., St. Louis;* "Railway Specialties," a moving picture, with explanation by *G. A. Richardson, Midvale Steel & Ordnance Co., Philadelphia.*

Apr. 13, 1923.—"St. Louis Railroad Terminals and Changes Which Have Been Suggested to Facilitate and Extend Their Operation." By *Col. F. G. Jonah, Assistant to President and Chief Engineer, St. L. & S. F. R. R., St. Louis.* "Traffic Matters." By *Alexander Hilton, Vice President, St. L. & S. F. R. R., St. Louis.*

Dec. 8, 1922.—"The Transportation Act." By *W. G. Besler, President Central Railroad of New Jersey, New York City.*

Jan. 12, 1923.—"The St. Louis Bond Issue of 1923." By *Edgar Gengenbach, Manager for the Issue.* Discussion, *Ed. Kinsey, President Board of Public Service; E. A. Hadley, Chief Engineer, Missouri Pacific R. R.; C. E. Smith, Consulting Engineer, City of St. Louis; H. J. Pfeifer, Chief Engineer Terminal R. R. Association; Col. F. G. Jonah, Assistant to President and Chief Engineer, St. Louis & S. F. R. R.*

Feb. 9, 1923.—"High Points of My Trip Around the World." By *Frank P. Glass, Editorial Director St. Louis Star.* Moving picture, "Manufacture of Iron and Steel Sheets," with explanation by *E. M. Johnston, District Manager, American Rolling Mill Co.*

THE RAILWAY CLUB OF PITTSBURGH

John D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa.
Secretary.

May 25, 1922.—"RADIUM, The Wonder Element." By *Louis Fenn Vogt, Works Manager, Standard Chemical Co., Pittsburgh.*

Sep. 28, 1922.—"The Designing and Building of Steel Freight Car Equipment." By *John A. Pilcher, Mechanical Engineer, Norfolk & Western Ry., Roanoke, Va.*

Oct. 26, 1922.—Annual Meeting—Election of Officers.

Nov. 23, 1922.—"Public Relations of the Railroads." By *F. X. Milholland, Assistant to President, B. & O. R. R. Baltimore, Md.*

Dec. 28, 1922.—"Radio Communication." By *S. M. Kintner, Manager, Research Department, Westinghouse E. & M. Co., East Pittsburgh.*

Jan. 25, 1923.—"Our Stellar Universe." By *Dr. H. D. Curtis, Director, Allegheny Observatory, Pittsburgh.*

Feb. 22, 1923.—"The Story of Portland Cement." By *Col. H. C. Boyden, Portland Cement Association, Chicago, Ill.*

Mar. 22, 1923—"Chemistry in the Service of the Railroad." By *James O. Handy, Director, Chemical and Metallurgical Investigation, The Pittsburgh Testing Laboratory, Pittsburgh.*

Apr. 26, 1923.—"The Container Car." By *F. S. Gallagher, Engineer of Rolling Stock, N. Y. C. R. R., New York City.* "The Melting Pot." By *James B. Horn.*

May 24,1923.—"The Future of the Railroads." By *Samuel O. Dunn, Editor, Railway Age, Chicago, Ill.*

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB

A. J. Merrill, P. O. Box 1205, Atlanta, Ga.
Secretary.

Sep. 21, 1922.—No meeting.

Nov. 16, 1922.—Annual meeting and Barbecue.
Reports of Secretary and Treasurer.

Jan. 18, 1923.—"The Locomotive Booster." By *John A. Talty, Franklin Railway Supply Co., New York.*

Mar. 15, 1923.—"Locomotive Boiler Water Circulation." By *C. A. Seley, Chicago.*

May 17, 1923.—"Automatic Train Control." By *L. F. Hiward, Chief Engineer, Union Switch & Signal Co.*

CANADIAN RAILWAY CLUB

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May 9, 1922.—Annual Meeting.

Sep. 10, 1922.—"Radio." By *W. T. Hawes of the Perkins Electric Company, Montreal.*

Oct. 10, 1922.—"Some Elements of Economy in Air Compression." By *William Carter, A.S.M.E., Assistant General Sales Manager, Canadian Ingersoll Rand Co., Montreal.*

Nov. 14, 1922.—"Some Recent Developments in Locomotive Construction." By *Grafton Greenough, Vice President, Baldwin Locomotive Works, Philadelphia.*

Dec. 12, 1922.—"Present Day Tendencies in Car Construction." By *E. R. Viberg, Chief M. E., Canadian Car & Foundry Company, Montreal.*

Jan. 9, 1923.—"The Kiln-Drying of Lumber." By *F. O. Farey, Chief Chemist, Robert W. Hunt Company, Montreal.*

Feb. 13, 1923.—"How Railway Tickets are Prepared, Printed and Handled." By *W. B. Cookson, Manager. Traffic & Ticket Bureau, Canadian National Railway, Montreal.*

Mar. 13, 1923.—"Can the 2-8-0 (or 4-8-0) Locomotive be Further Developed?" By *George Bulkeley, A.M.I.M.E., General Manager's Staff, Great Western Railway of England.*

Apr. 10, 1923.—"The Legal Department of the Railway and its Functions." By *E. P. Flintoft, Assistant General Solicitor, Canadian Pacific Railway, Montreal.*

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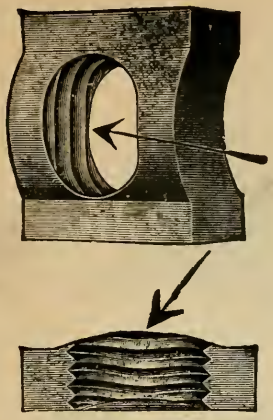

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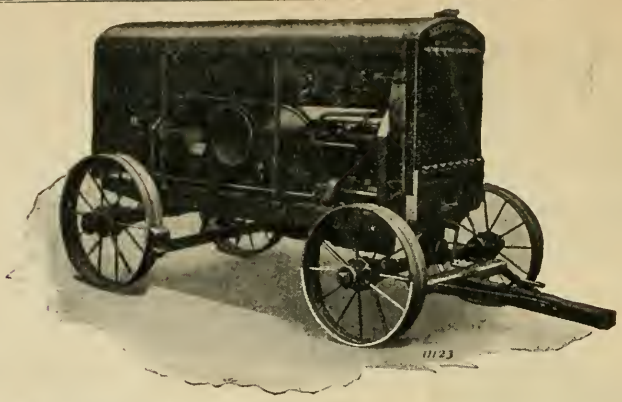

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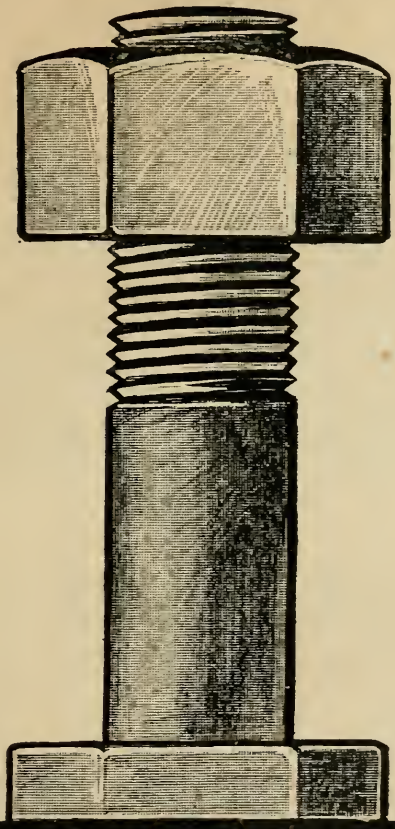

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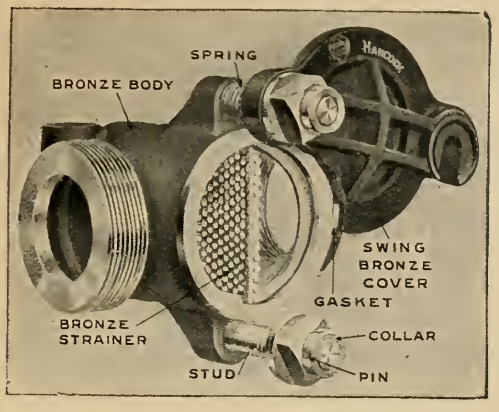

Fig. 3551

The Locomotive Hose Strainer shown in the cut consists essentially of a perforated plate of ample area, mounted in grooves in the body. The opening through which the screen is introduced is closed by a cover, making a water tight fit.

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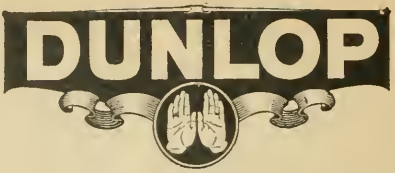

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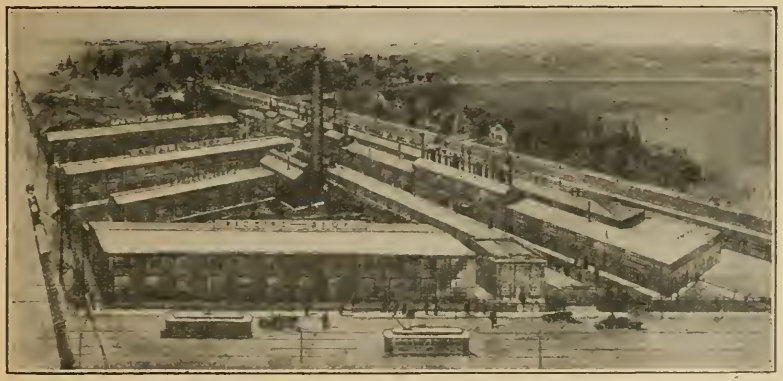

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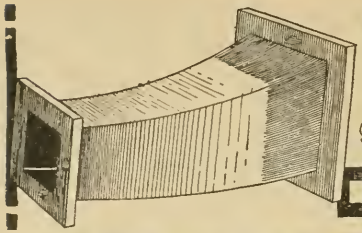

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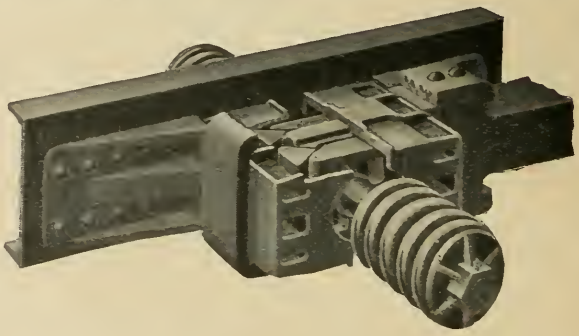

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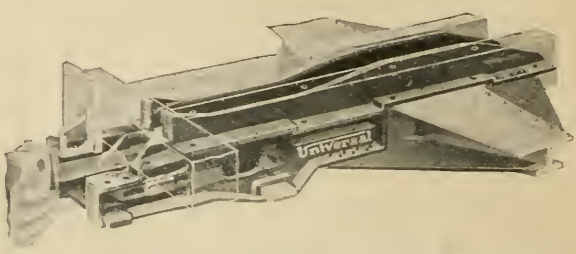

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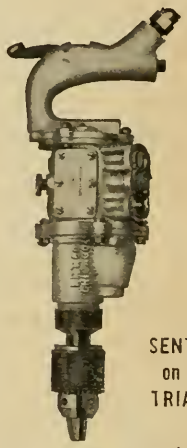

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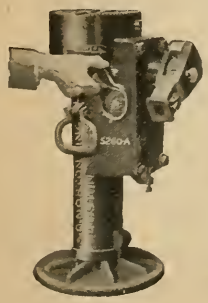

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There are many districts on which water softeners have been built in the belief that they would eliminate water troubles. In actual operation these plants are only partially effective, but representing an investment of thousands of dollars, they are kept in use, although inadequate, and the equipment and operating cost suffer accordingly.

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We will make a survey of your water conditions, including complete mineral analysis, and submit recommendations looking to the greatest possible benefits for you. If we recommend Dearborn Treatment, we guarantee results. Dearborn treatment costs less than the chemicals required in a treating plant, and calls for no investment in plant or equipment. There is no expense other than the cost of the treatment.

Roads using Dearborn Treatment have at their command at all times the services of the Dearborn Laboratory and expert engineers.

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OUR STANDING OFFER

Let us make our laboratory analysis of your water supplies. Let us place our recommendations before you. Consider our methods, our laboratory control. Compare the expense and THEN decide. Write us direct sending water samples.

NOTE:—Dearborn Treatment is being used in a number of cases in conjunction with water softeners to give them increased effectiveness.

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